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Dear Representative/Senator, December 2nd, 2012

As concerned citizens and as researchers who study human cognition and performance, we encourage the legislature to pass SB756 (Kelsey's Law) to address safety hazards associated with young drivers' use of cell phones while driving. In this letter, our goal is to highlight the main conclusions from the considerable body of observational and experimental research on this issue. (For further details, see the two attached articles from peer-reviewed scientific journals.)

- First, the research has consistently demonstrated that talking on a cell phone while driving **is a significant safety hazard**. In fact, the research suggests that **the safety impact of cell phone use is similar to driving while drunk.** The laws against drunk driving establish a precedent for the regulation of driving in the interest of public safety; the finding that cell phone driving poses a similar level of risk, suggest that it too may warrant regulation.
- Second, talking on a cell phone while driving produces **greater driving impairments than other potential distractions**-- for example, listening to the radio or talking to a fellow passenger.
- Third, there are **minimal differences between hands free and hand held cell phone use**. Both have equally bad effects on driving performance.
- Fourth, **inexperienced drivers have high incidence of traffic crashes and traffic fatalities**, and distraction is a major contributor to these crashes.
- Fifth, the distraction caused by cell phone use is likely to be **more problematic for novice drivers** for whom the driving task requires substantial cognitive resources.

In sum, cell phone use while driving is a serious hazard **because it occupies the mind.** We urge the state legislature to address the safety hazards of cell phone use while driving. While the preponderance of the evidence suggests that banning cell phone use (both hand-held and hands-free) for drivers of all ages would be beneficial, SB756 offers a good starting point. It targets cell phone use in a population that is at high-risk for traffic accidents, and a group that is particularly likely to show significant benefits in driving performance from reduced distraction.

Thank you for your attention to our comments and recommendations on this important matter.

Sincerely yours,

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NOTE: If you or your staff would like more information on cell phone use while driving, please feel free to contact Professor Mark Becker (517-432-3367, becker54@msu.edu)

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Eye Movement Patterns for Novice Teen Drivers Does 6 Months of Driving Experience Make a Difference?

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Abstract

Attention to the road is essential to safe driving, but the development of appropriate eye glance scanning behaviors may require substantial driving experience. Novice teen drivers may focus almost exclusively on the road ahead rather than scanning the mirrors, and when performing secondary tasks, they may spend more time with eyes on the task than on the road. This paper examines the extent to which the scanning of novice teens improves with experience. For this study, 18 novice teen (younger than 17.5 years old) and 18 experienced adult drivers performed a set of in-vehicle tasks and a baseline driving segment on a test track, the teens within 4 weeks of licensure and then again 6 months later. This paper addresses the following questions: Did teen eye glance performance improve from initial assessment? Did teens and adults still differ after 6 months? Results for some tasks showed that rearview and left mirror–window (LM-W) glances improved for teens from initial testing to the 6-month follow-up and that some differences between teens and adults at initial testing were no longer significant at the 6-month follow-up, suggesting significant learning effects. The frequency of rearview and LM-W glances during secondary tasks improved among teens at the 6-month follow-up, but teens still had significantly fewer glances to mirrors than did adults when engaged in a secondary task.

Unintentional injury is a major cause of death among adolescents, with about 79% of the unintentional deaths of 16- and 17-year-olds due to motor vehicle crashes (1). Motor vehicle crash rates for teens are highest among novice teen drivers during the first 6 months and 1,000 mi (1,609 km) after licensure (2,3), and increased amounts of supervised practice driving have not been shown to be associated with lower risk (e.g., *4*). Having the eyes off the road for a period when an unexpected event occurs has been shown to be an important cause of crashes and near crashes; thus routine visual search is a key metric or objective measure for driving performance (5).

Early research concluded that novice and experienced drivers differed in their visual acquisition process and that novice drivers drive less safely (6,7). For example, new drivers may tend to focus almost exclusively on the road ahead and spend less time scanning the mirrors. In addition, when engaged in a secondary task, a novice driver may maintain his or her eyes off the road for extended periods. This may be because of carelessness, distraction, or lack of habitual (automatic) scanning patterns. As drivers gain experience, many aspects of safe

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driving, such as eye glance behavior and scanning patterns, become more or less automatic (8). Once eye glance scanning patterns are ingrained, as they are thought to be for experienced drivers, these patterns are likely to persist even in an environment where no other traffic is present. However, few studies have compared novice drivers with experienced drivers on eye glance and scanning behaviors, and no studies could be found that examine changes in these behaviors from the time of licensure.

Background

Eye Glance Research Relevant to Experienced Drivers

Early eye glance research focused on driving alone and indicated that, as experienced drivers became familiar with a route, they were better able to detect potential traffic threats due to a strategy of confining their visual zone and of looking straight ahead (9,10). Other research studied the eye glance patterns of drivers as they performed secondary tasks (e.g., radio, speedometer, navigation systems) (11–14), including measures such as visual glance duration, number of glances per task, glance frequency (glances to a particular target), glance duration (including transition movement), percentage of time (at a target), number of glances during a task, eyes-off-road (EOR) time, and task completion time (e.g., *15, 16*), following standardized methods (17). Recent driving research on experienced drivers revealed that, during driving while engaged in no other tasks, the instrument panel received almost twice as many glances as the left mirror, which in turn received more than twice as many glances as the rearview mirror (RVM). However, when experienced drivers were performing a verbal or spatial-imagery task, their eye fixations toward the RVM decreased significantly and a reduction of the visual-inspection window—an imaginary box representing both the horizontal and vertical gaze of the driver—was observed (18–20).

Eye Glance Research Relevant to Novice Drivers

An excellent summary about experience and eye movements appears in Crundall and Underwood (21). Early work by Mourant and Rockwell (9,10) indicated that novice drivers sampled the lane lines frequently, whereas experienced drivers relied on peripheral vision to maintain lateral lane position (9). On-road research conducted in Finland (22) with inexperienced drivers (18 to 24 years old) and experienced drivers (29 to 44 years old) revealed that novices had larger variations in their glance duration and that 29% of novices had glances of greater than 3 s for in-vehicle tasks (i.e., inserting a tape cassette, dialing a phone number on a mobile phone, tuning a radio station). In addition, novices' long glances were associated with large lateral displacements of the vehicle (22). In another more recent study, significant differences were found between teens and adults in their ability to monitor the forward environment and simultaneously to perform handheld cell phone tasks in a driving simulator (23). Results indicated that teens missed 54% of lane violations occurring in front of them while performing a phone task while adults missed only 14% of events. Another simulator study (24) investigated risk perception and indicated significant differences in recognizing potential risks (i.e., pedestrians or vehicles) between novice teens (aged 16 and 17) and experienced older drivers (aged 60 to 75) in three simulated driving tasks. Overall, experienced drivers recognized potential risks 66% of the time, while novice teen drivers recognized risks only 35% of the time (24). Recently, Chisholm and colleagues (25) examined the effect of cell phones on driving for both experienced drivers (mean age of 32 years) and novice drivers (mean age of 17 years) by using a driving simulator. They found that novice drivers displayed perception response times that were an average of 0.19 s longer than those for experienced adults and that all participants spent less time looking in the RVM during a CD-changing task.

This paper describes eye glance performance from a recently completed two-part data collection effort that included novice teen drivers and experienced adult drivers. The first part of this study involved an initial session referred to as time zero or T_0 that included both teen and adult participants. Test track assessments conducted within a few weeks of teen licensure (26) showed that novice teens performed less well than experienced adults on test track tasks:

- During baseline (no-task) driving during the initial T_0 session, teens had significantly fewer glances to the RVM than adults.
- While driving and performing in-vehicle tasks

  Teens had significantly more eyes-off-road (EOR) time during the reading task than adults.

  Teens had significantly higher rates of eyes on the display (EOD) than adults over all tasks.

  Teens had significantly fewer glances to the RVM than adults over all tasks.

  Teens had significantly fewer glances to the left mirror–window (LM-W) than adults over all tasks.

Lee et al. (26) reported several findings about the first T_0 session. Their conclusions were that teens consistently failed to check the mirrors and had more EOR time than adults during more challenging tasks (26). This conclusion suggests that the eye glance scanning patterns for novice teen drivers were not as well developed as those of experienced adult drivers, a finding that is in agreement with driving-simulator research involving novice drivers (23,24). That is, experienced adults were better able to divide their attention between in-vehicle and out-of-vehicle demands.

Study participants were retested after 6 months (T_6). The purpose of this research was to study the eye glance patterns of experienced adult drivers and novice teen drivers soon after licensure and 6 months later, while performing selected maneuvers on a test track. Two overarching research questions guided the analyses:

1. For those measures in which teens and adults exhibited significant differences in eye glance behavior at T_0, did teens at T_6 differ from teens at T_0 (i.e., did the teens' eye glance performance improve over the first 6 months?)?
2. For those measures in which teens and adults exhibited significant differences in eye glance behavior at T_0, were these differences extinguished after 6 months of independent driving experience (i.e., did teens and adults still differ at T_6?)?

Method

Participants

A sample size of 36 participants was selected on the basis of several power analyses. Analyses were completed on the basis of data collected in a previous Virginia Tech Transportation Institute (VTTI) study (27) that included 16 drivers aged 25 to 55 divided into a young group (M = 30 years) and an old group (M = 47 years). Power analyses were conducted by using average speed, speed standard deviation, percentage of EOR time, and number of slight lane deviations, following a procedure outlined by Liu et al. (28), assuming power ($1 - B$) of .80 and with significance level (α) of .05. On the basis of this procedure, the sample size of 36 participants was selected.

Participants included 18 recently licensed teen drivers (M = 17.1 years, SD = 0.4) and 18 experienced adult drivers (M = 43.4 years, SD = 4.3), with equal distribution of males and females in each group. For teens, mean driving experience at T_6 was 7.0 months (SD = 0.6 months), approximately 3,076 total miles (4,950 km), or both; for adults, mean driving experience was approximately 293,597 total miles (472,499 km). Teen participants were recruited through driving schools. Adult drivers were recruited from an existing VTTI participant database consisting of approximately 2,000 potential local participants who had indicated willingness to participate in VTTI studies. All participants were licensed to drive in the Commonwealth of Virginia and had at least 20/30 corrected vision. At T_0, parental consent and teen assent were obtained for the teen study participants; consent for adult participants was also obtained. Upon returning for the 6-month follow-up session (T_6), both teen assent and adult consent were verified. The entire session took approximately 1.5 h, and participants received $20/h for participation.

Apparatus

The same equipment and procedures were used for the follow-up T_6 session as were used in the initial T_0 session.

Test Track—The T_6 session was conducted at the VTTI on the Virginia Smart Road, a 2.2-mi (3.5-km) test track with a signalized intersection. The traffic signal timing and phase were controlled with a simulated dedicated short-range communication link and were activated as the test vehicle approached the intersection. No other traffic and no pedestrians were on the test track during the session.

Test Vehicle—The test vehicle was a 2000 Chevrolet Impala with safety equipment that included antilock brakes, airbags, traction control, and an emergency passenger side brake. The vehicle was instrumented with a customized real-time data acquisition system (DAS) with a separate computer to run the experimental scenarios and control traffic signal activation. The DAS recorded speed, acceleration, pedal positions, and four video data streams.

Design

A pre–post mixed design was used, with age (novice teen and experienced adult), gender, and session (T_0 and T_6) as between-participants variables and task (baseline driving, five in-vehicle tasks, and one phone-plus-intersection task) as the within-participants variable. Dependent measures included the number of glances to specific locations, percentage of EOR time, and percentage of EOD time (e.g., time spent looking at the cell phone).

Procedure

Participants underwent a static orientation to the vehicle controls and in-vehicle tasks before entering the test track. Once they were on the test track, an initial baseline (no-task) condition was completed; this was followed by a series of five in-vehicle tasks, each completed while the participant was driving and after he or she had passed through a green traffic signal at the intersection. The order of these five tasks was counterbalanced across participants. Each task was performed three times: the first time while the vehicle was stationary and the second and third times while it was moving. The first two iterations were considered practice, and therefore only the third iteration is discussed in this paper (second iterations were used only for the baseline driving segment and the phone-plus-intersection task). The phone-plus-intersection task followed the five in-vehicle tasks and was the first task in which the traffic signal changed.

For all tasks, participants were instructed to maintain 35 mph (56 km/h), exercise normal lane management, obey the traffic signal, and maintain road safety throughout the study. One experimenter was seated in the front passenger seat and provided instructions; a second experimenter (located in the back seat to run the data collection software) did not interact with the participant, except to say, "Begin," for the phone-plus-intersection task. Additional intersection tasks were completed (without a phone task) and are not reported here (see *29, 30*). All tasks were completed during daylight and with dry road conditions.

Participants were aware that no other vehicles would be encountered on the road during the experiment. Task instructions were given while the vehicle was stopped. Once the participant began driving and achieved 35 mph (56 km/h), the experimenter said, "Begin," and the participant began the task. The participant said, "Done," when the task was complete. The tasks were designed and selected to require a range of manual, visual, and auditory interactions with the vehicle and objects in the vehicle as well as to cover several levels of cognitive demand. Radio, CD, and reading tasks were administered by following the protocol outlined by the Crash Avoidance Metrics Partnership (CAMP) (31). The reading passages were also developed by CAMP (31) and were designed to have a Flesch–Kinkaid score for the 5th- to 6th-grade reading level. The tasks discussed in this paper include

- Baseline (driving with no in-vehicle tasks),
- Radio (turn on the radio, switch it to FM, and tune to a certain radio station),
- CD (insert a certain CD and advance to a certain track),
- Reading (read a short passage and provide an answer for a missing word in the passage),
- Cell phone (dial 511, listen to recorded traffic information, and orally report the number of traffic incidents),
- Calendar (use the calendar function on a cell phone to view and read an appointment screen), and
- Phone-plus-intersection task described in detail below.

For the radio and CD tasks, the vehicle's dashboard-mounted system was used. The power button, AM/FM button, and tuner dial were used for the radio task. For the CD task, an appropriate CD was selected from a visor-mounted CD holder; the CD was inserted into the player; and a scan button was used to move forward to the appropriate track. For the short reading task, an 8.5- × 11-in. (21.6- × 27.9-cm) white paper placard was used. The placard included a passage of 30 words, in portrait format and 16-point Times New Roman font. A handheld Motorola T731 flip cell phone was used for the in-vehicle cell phone tasks. For the 511 task, the participant dialed 511, listened to recorded traffic information, and orally reported the number of traffic incidents listed.

Participants experienced at least one practice driving loop, a baseline segment, and several passes through the intersection during green lights before the phone-plus-intersection task. For this task, the participant was instructed to start driving the vehicle and to maintain 35 mph (56 km/h). The experimenter said, "Begin," at 700 ft (213 m) from the intersection to cue the cell phone task. The process involved several steps, including dialing 540-555-1212 (a national telephone directory service), listening to a recorded welcome message and then a live operator, speaking the city, stating the last name for a listing, and then being connected. This process took approximately 60 s but was never completed before reaching the intersection.

The research vehicle sent a wireless signal commanding the signal controller to change the light to amber when it was 200 ft (61 m) from the intersection (3.9 s). To increase the difficulty of this intersection task, the amber phase was shortened from the standard 35 mph (56 km/h) amber phase of 3.6 s to 2.6 s. The light would therefore turn red 1.3 s before the driver entered the intersection. The actual driving session lasted approximately 1 h.

Data Preparation and Analysis

Data reductionists viewed the digital video and assigned driver eye glances to various glance locations in accordance with methods commonly used for this sort of analysis (e.g., *17, 32,* *33*). All glances included the transition time to move from the previous glance location to the current location. Glance locations used for this study included forward, speedometer, RVM, LM-W, right (mirror–window), and task locations (phone, radio–CD, and reading). Two experienced data reductionists, who received additional training for this project, conducted the eye glance analysis. A total of 11% of the events were analyzed independently by each data reductionist, with a mean inter-rater reliability of .96 (SD = 0.05). Analysis of variance was used to examine differences in continuous eye glance measures, while Poisson regression (scaled to account for dispersion) was used to analyze differences in the count data for the number of eye glances (34).

Results

Baseline Driving

Figure 1 shows that, in the initial T_0 session, teens had significantly fewer glances to the RVM (M = 0.06, SD = 0.24) than did adults (M = 0.61, SD = 1.24) during baseline driving (Poisson $F_{1,34} = 9.34$, $p = .002$). At T_6, the mean number of glances to the RVM was 0.28 glance (SD = 0.58) for teens and 0.44 glance (SD = 0.86) for adults (not significant: Poisson $F_{1,34} = 0.63$, $p = .434$). As shown in Figure 1, the mean number of glances to the RVM increased significantly for teens from T_0 to T_6 (Poisson $F_{1,34} = 4.63$, $p = .031$). No significant differences were found for adults from T_0 to T_6 (Poisson $F_{1,34} = 0.31$, $p = .581$).

Driving and Performing In-Vehicle Tasks

EOR Percentage During Reading Task—As shown in Figure 2, at T_0, teens had significantly more EOR time (69%, SD = 0.077) than adults (63%, SD = 0.086) during the reading task ($F_{1,34} = 4.29$, $p = .046$). However, at T_6, the percentage of EOR during the reading task was 68% (SD = 0.058) for teens and 69% (SD = 0.067) for adults (not significant: $F_{1,34} = 0.53$, $p = .4371$). The percentage of EOR during reading increased significantly for adults from T_0 to T_6 ($F_{1,17} = 11.92$, $p = .003$). However, for teens, no significant differences were found from T_0 to T_6 ($F_{1,17} = 0.25$, $p = .625$).

EOD Percentage for All In-Vehicle Tasks—As shown in Figure 3, teens at T_0 had a significantly higher percentage of EOD (45%, SD = 0.195) than adults (41%, SD = 0.195) over all tasks ($F_{1,34} = 4.18$, $p = .049$). At T_6, the percentage of EOD during in-vehicle tasks was 44% (SD = 0.205) for teens and 45% (SD = 0.210) for adults (not significant: $F_{1,34} = 0.05$, $p = .824$). The teen EOD percentage did not change from T_0 to T_6 (not significant: $F_{1,17} = 0.04$, $p = .850$). The adult EOD percentage was significantly different from T_0 to T_6 ($F_{1,17} = 6.98$, $p = .0171$).

Number of RVM Glances for All In-Vehicle Tasks—As shown in Figure 4, teens at T_0 had significantly fewer RVM glances (M = 0.03, SD = 0.214) than adults (M = 0.27, SD = 0.769) over all in-vehicle tasks (Poisson $F_{1,34} = 21.77$, $p < .0001$). At T_6, adults still had significantly more RVM glances (M = 0.19, SD = 0.477) than teens (M = 0.08, SD = 0.458) (Poisson $F_{1,34} = 6.50$, $p = .0012$). From T_0 to T_6, teen RVM glances increased significantly (Poisson $F_{1,213} = 8.23$, $p = .005$). However, for adults, RVM glances were not significantly different from T_0 to T_6 (Poisson $F_{1,214} = 1.79$, $p = .182$). Thus, the number of RVM glances improved from T_0 to T_6 for teens, but teens still had significantly fewer glances than did adults.

Number of LM-W Glances for All In-Vehicle Tasks—As shown in Figure 5, teens at T_0 had significantly fewer LM-W glances (M = 0.02, SD = 0.192) than adults (M = 0.15, SD = 0.561) over all in-vehicle tasks (Poisson $F_{1,34} = 21.77$, $p < .0001$). At T_6, adults still had more LM-W glances (M = 0.13, SD = 0.531) than teens (M = 0.06, SD = 0.269), but this difference was no longer significant (Poisson $F_{1,34} = 1.94$, $p = .172$). From T_0 to T_6, teen LM-

W glances increased significantly (Poisson $F_{1,213} = 8.09, p = .005$). For adults, no significant differences were found between T_0 to T_6 (Poisson $F_{1,214} = 0.17, p = .677$). Thus, the number of LM-W glances improved from T_0 to T_6 for teens to a level that approached that of adults (although adults still had twice as many glances).

Discussion of Results

This research addressed two questions about each eye glance measure: Did novice teen eye glance performance improve during the first 6 months after licensure? Did teen and adult eye glance performance differ after 6 months?

A summary of the findings follows:

1. Baseline driving. The number of RVM glances improved from T_0 to T_6 among teens. Differences between teens and adults at T_0 were no longer significant at T_6.
2. EOR. The percentage of EOR time for the reading task did not improve from T_0 to T_6 for teens; however, the differences between teens and adults observed at T_0 were no longer significant at T_6, as the percentage of EOR time for adults increased.
3. EOD. The percentage of EOD time during in-vehicle tasks did not improve from T_0 to T_6 for teens; the differences between teens and adults at T_0 were no longer significant at T_6, because the adults' percentage of EOD time was higher at T_6 and equal to that of teens.
4. RVM glances. The number of RVM glances improved from T_0 to T_6 among teens; however, there were still significant differences between teens and adults at T_6, with teen performance worse than that of adults.
5. LM-W glances. The number of LM-W glances improved for teens from T_0 to T_6. In addition, the differences between teens and adults observed at T_0 were no longer significant at T_6.

In summary, the scanning behavior of novice teen drivers was significantly worse than that of experienced adults on several measures of eye glance during certain test track tasks at T_0, improved significantly during the first 6 months of licensure, but remained significantly worse than experienced adults on some measures at the 6-month follow-up. These findings are in general agreement with on-road research completed in Finland (22), which reported that novices display more variations in glance duration, and that 29% of novices had glances longer than 3 s for in-vehicle tasks. The findings are also in agreement with recent simulator research reporting that novice drivers miss important cues in the external driving environment at a higher rate than adults do (23,24). It appears that 6 months of independent driving experience leads to improvement in scanning of locations (i.e., RVM and side mirrors) that are important for safe driving (32); that is, scanning of RVM and side mirrors has a protective effect on driving safety. Scanning the left mirror and RVM accounts for approximately 2% to 5% of glances during baseline driving (35,36).

In general, teens improved from the first driving session to the follow-up, but there were still significant differences between teens and experienced adults for RVM glances for driving while completing in-vehicle tasks. So, while teens improved significantly after 6 months of independent driving experience, there was room for additional improvement under the more complex driving conditions of engaging in a secondary task. For LM-W glances, although glance patterns between adults and teens did not differ statistically, adults had about twice as many glances to the mirrors as did teens at posttest. It is possible that the increase in EOD percentage for adults across tasks had an effect on (i.e., lowered) their rates of LM-W glances. That is, one could imagine that spending more time looking at the task display while driving would thus leave less time for making glances toward the mirrors; however, even with EOD percentage increases, adult LM-W glance rates remained higher than those of teens. As expected, experienced adults displayed consistent mirror scanning from the initial session to the 6-month follow-up in most cases, even when performing relatively difficult tasks. Such tasks appear to have had a detrimental effect on the mirror-scanning behavior of teen drivers even after 6 months of driving experience.

A number of limitations should be acknowledged: (*a*) participant samples were convenience samples and were not randomly selected; therefore, selection bias is possible (however, studies of this type commonly obtain participants in this manner); (*b*) eye glance frequency is only one of several possible measures of driving performance; (*c*) test track driving is not the same as on-road driving, although it is a close approximation (novice teens in particular may drive differently in this environment compared with adults, despite efforts to provide the same context and ample predrive training); (*d*) the tasks that were evaluated may not be fully representative of usual driving; and (*e*) age and inexperience cannot be disentangled in this cross-sectional design. These limitations affect generalization and point out the need for more research on this topic, especially on-road studies observing real-life situations and additional test track conditions that are more challenging and that replicate real-life hazards.

Conclusion

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The findings are consistent with the hypothesis that mirror and window scanning among novice teenage drivers improves over a 6-month period, except under the more complex driving condition of engaging in a secondary task. This finding suggests that at least some novices with 6 months' experience have not yet developed the well-engrained habit of frequent scanning. Additional research is needed to determine the extent to which eye glance improves with time under various driving conditions. It has not been shown that driver training improves eye glance performance, although Pradhan et al. (24,37) have developed a promising program, known as the Risk Awareness and Training Program, that emphasizes risk perception via measurement of eye movements. Moreover, while it seems that routine eye glance patterns improve over 6 months of independent driving, it is unclear how much driving experience is needed before safe eye glance and scanning patterns become established to the point that they can be maintained, even while engaging in any of the variety of secondary tasks common among drivers, or in the presence of in-vehicle distractions such as teenage passengers.

Verification of the findings by additional research would warrant a recommendation that policies and parents set limits on secondary tasks that novice teen drivers are allowed during the first 6 months of independent licensure while they gain needed experience.

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Further test-track and on-road research is needed to determine the extent to which eye glance and other driving performance measures improve over time. An ongoing study will use similar methodology to examine a different cohort of novice drivers (40 novice teens and their parents) immediately after licensure and then 12 months later. This new study includes additional hazard detection tasks designed to represent those that may be encountered under actual traffic conditions (e.g., blocked stop sign, pedestrian detection) similar to scenarios used by Pradhan et al. (24,37). The ramifications of including such tasks may allow results to be more generalizable to the driving behavior of teens on public roadways. The new study will also address the question, Does twelve months of driving experience make a difference? as well as several other questions. Thus, the effect of experience on eye glance scanning among teens can be better understood and the driving experience (and safety) of novice teen drivers can be improved.

The overall results show that the scanning patterns of teen drivers while performing in-vehicle tasks improved over time. However, after 6 months of experience, scanning patterns for teens were still not as well developed as those of experienced adults on some measures. These findings indicate that, as a measure of driving performance, eye glance frequency to the RVM and left mirror improved with 6 months of postlicensure experience but was still less than that of experienced adults when performing in-vehicle tasks.

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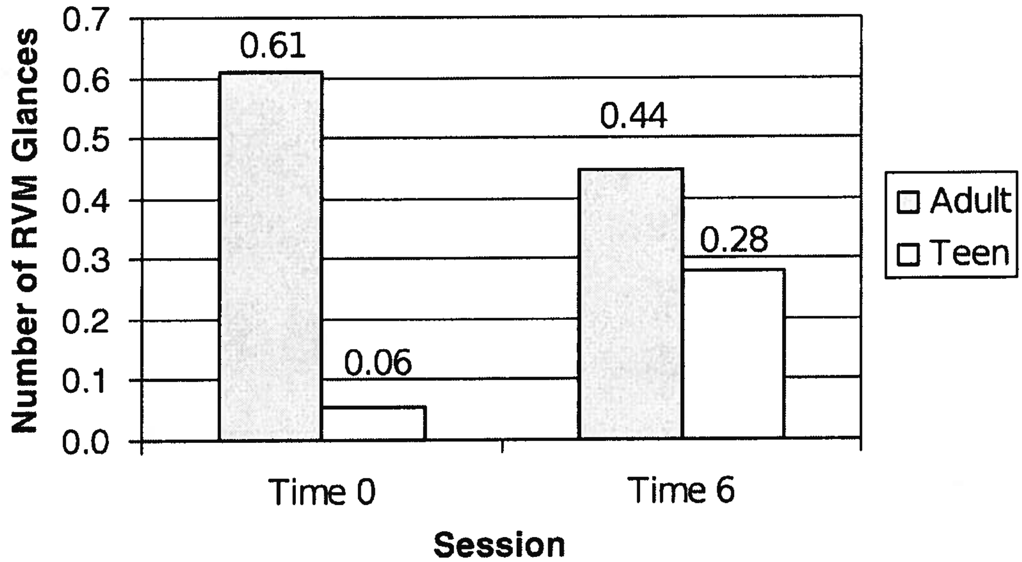

FIGURE 1. Mean number of rearview glances during baseline driving for experienced adult and novice teen drivers in T_0 and T_6 sessions

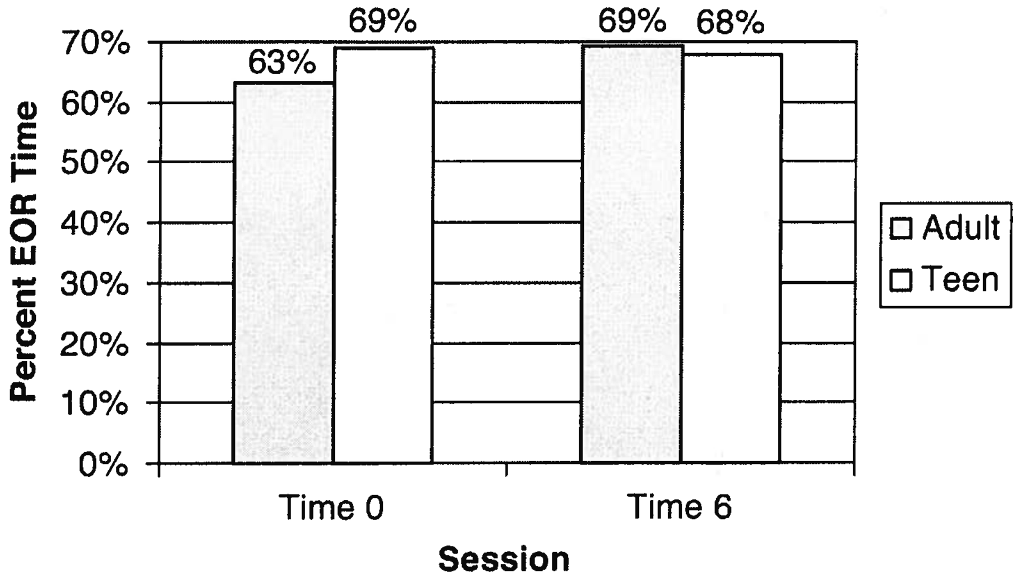

FIGURE 2. Percentage of EOR time during reading task for experienced adult and novice teen drivers in T_0 and T_6 sessions

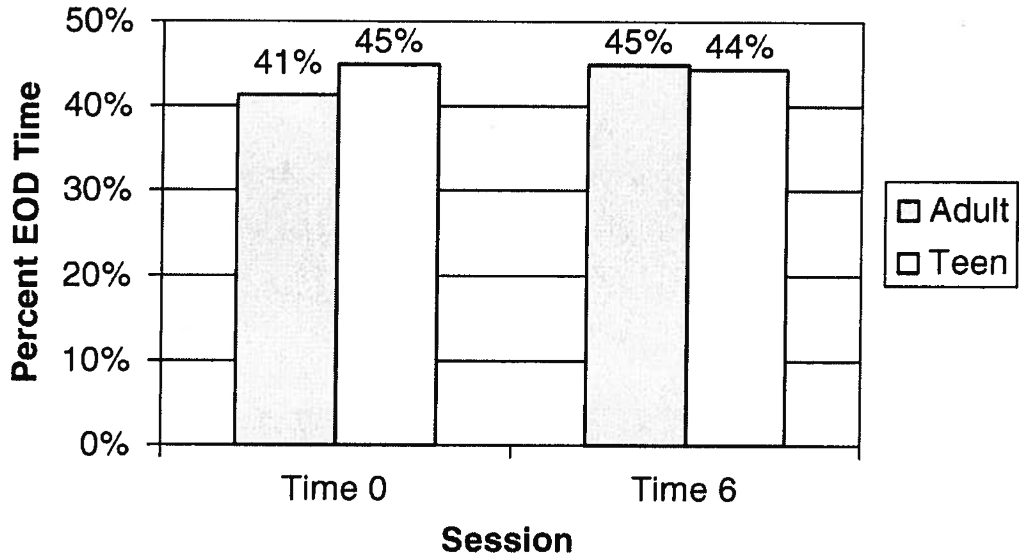

FIGURE 3. Percentage of EOD time during in-vehicle tasks for experienced adult and novice teen drivers in T_0 and T_6 sessions

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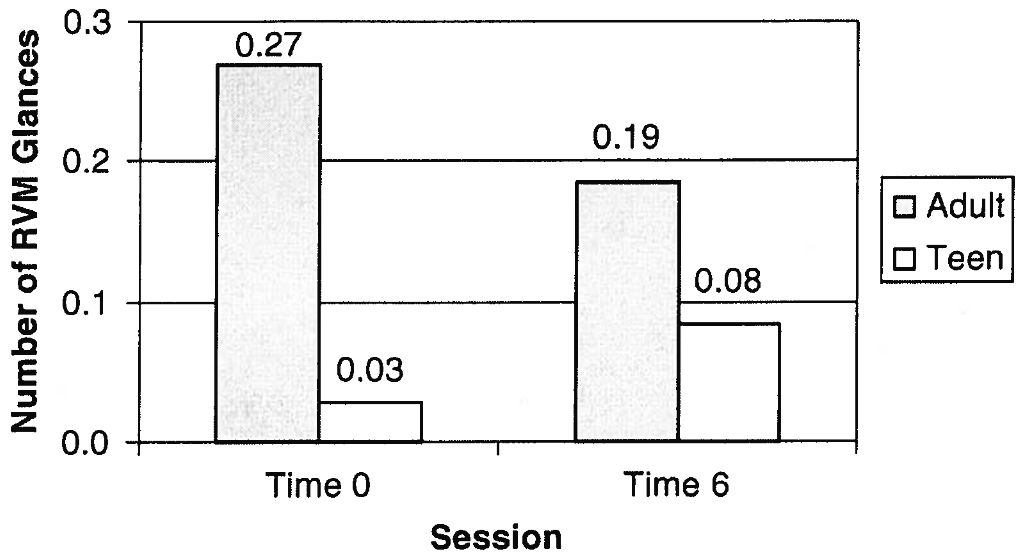

FIGURE 4. Number of RVM glances during in-vehicle tasks for experienced adult and novice teen drivers in T_0 and T_6 sessions

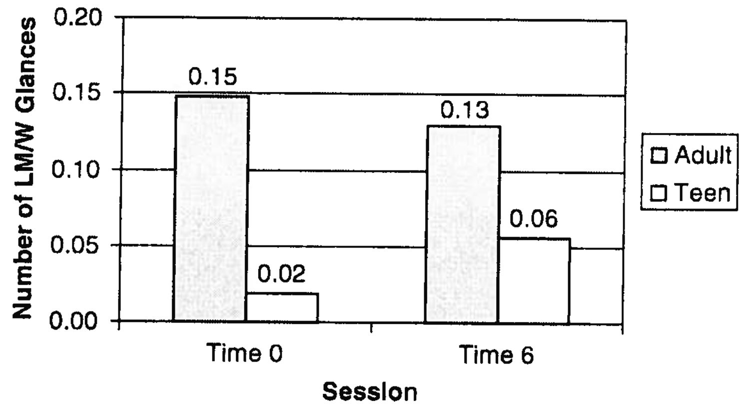

FIGURE 5. Number of LM-W glances during in-vehicle tasks for experienced adult and novice teen drivers in T_0 and T_6 sessions

Mary Lou Terrien

From: Mark W. Becker <becker54@msu.edu>
Sent: Monday, December 03, 2012 12:30 PM
To: Mary Lou Terrien
Subject: Kelsey's Law
Attachments: Letter- Kelsey's Law2.pdf; cellphone.pdf; nihms136820.pdf

Dear Mary Lou Terrien,

Please find the attached letter from a number of professors of Cognition and Cognitive Neuroscience at MSU concerning Kelsey's Law. As people who research human capacities and limitations, we are strongly in favor of the proposed legislation (although we would argue it might not go far enough). Unfortunately, I am unable to make the hearing on Wed (I teach at that time), but if there is any additional information that members of the committee want, they can feel free to contact me. I have also included pdfs of the two journal articles I mention in the letter.

Thanks,

Mark

Mark W. Becker
Assistant Professor
Department of Psychology
285B Psychology Building
Michigan State University
East Lansing, MI 48824

Mary Lou Terrien

From: Spike <spike1911@comcast.net>
Sent: Friday, November 30, 2012 7:53 PM
To: Rep. Mark Ouimet
Cc: Rep. Opsommer's Office (District 93); Rep. Ben Glardon; Rep. Wayne Schmidt (District 104); Rep. Matt Huuki; Rep. Brad Jacobsen; Rep. Paul Muxlow; Rep. Rick Olson; Rep. Pat Somerville; Rep. Roy Schmidt (District 76); Rep. Douglas Geiss (District 22); Rep. Alberta Tinsley Talabi; Rep. David Nathan (District 11); Rep. Lesia Liss (District 28); Representative Barb Byrum; Rep. Charles Smiley; Rep. Stacy Erwin Oakes (District 95); Mary Lou Terrien
Subject: NO ON SB 967

The Michigan State Senate recently passed Senate Bill 967, which gives a Regional Transit Authority (RTA) the power to designate existing travel lanes for the exclusive use of transit vehicles such as metro buses. The National Motorists Association strongly objects to this proposal since it prohibits motorists from using roadways they have helped pay for. Suppose transit vehicles run every 10 minutes on a major commuting artery. This means that a maximum of six vehicles per hour could use the lane. That is a massive waste of publicly owned and previously paid for transportation facilities. If a RTA is given the ability to confiscate existing lanes on existing roads, at a minimum it should be required to pay large up-front fees representing the current value of the lanes to the authorities who now have responsibility for those lanes, and to pay for all future costs of repairs and maintenance on them.

SB 967 is currently under consideration in the House Transportation Committee. Please vote this down; it's bad for Michigan and bad for your constituents.

Respectfully,

David L. Roberson
734-780-4957
1911 HARLEY DR
ANN ARBOR MI 48103-8978